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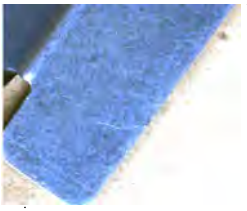

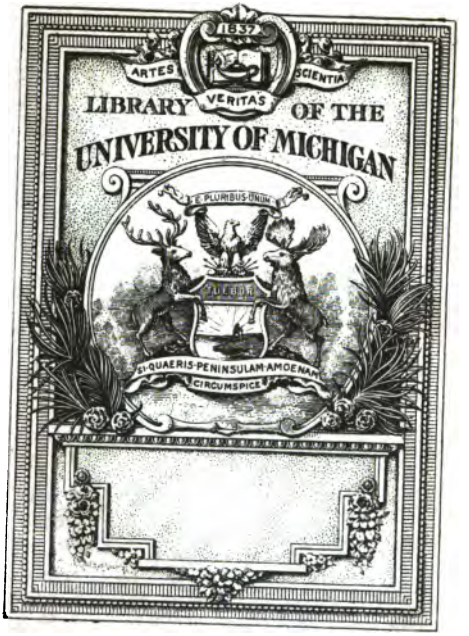
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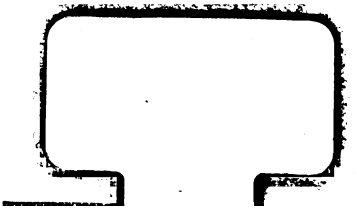

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URICACIDÆMIA;

ITS CAUSES, EFFECTS

11620

AND

TREATMENT.

BY

PERRY DICKIE, M. D.

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DEDICATION.

TO THE

MEMBERS OF THE CLASS OF '80,

IN WHOSE COMPANY THE AUTHOR PLODDED
THROUGH THE TORTUOUS BUT PLEASANT
PATHS OF MEDICAL LORE, THIS
LITTLE VOLUME IS MOST
HEARTILY DEDICATED.

PREFACE.

Knowing full well that the very complete and voluminous work, by Haig, on "Uric Acid," exists, and to which, by the way, the writer is largely indebted for much general information as to his interesting, ingenious, and valuable theories on this subject, in the preparation of this work, however, believing that something smaller and more compact might be acceptable to the physician, on this assumption he launches forth this little volume upon the sea of chance, hoping that it will meet with some success as to proving of slight value to the medical profession in elucidating the question as to the importance of uric acid as a disease factor.

URICACIDÆMIA.

INTRODUCTION.

That the past history of medicine has been the repository of innumerable fads and fancies is a veritable fact to which we can all readily attest without the slightest feeling of uncertainty; a large proportion of which being of a purely ephemeral and fleeting nature, often of no value from a scientific standpoint, while others of a kind more stable and lasting, have become, after passing through the ordeal of trial and experience, valuable factors of intrinsic worth.

In the memory of the modern physician of extended experience and observation will be cognizant of three, what we might term, epochs or periods, in which it would seem that the unanimous mind of the medical profession ran to a certain extent, as far as possible, in one channel, that is, to the certain points in question; which, by the way, as unanimity on any one subject in the medical profession being not a common occurrence,

we must therefore consider that when such as this happens it is surely deserving of the dignified title of epoch.

The principles of these in their beginning, although rather partaking of the nature of fads, and to many almost a subject of ridicule, however later did each a great fetich become; but time and experience demonstrating their full value and worth, the scoffers and mockers fell into line, as well as the scales falling from the worshippers' eyes, they therefore settled into their proper place in the domain of medicine.

Of the three subjects to which I have alluded as constituting epochs, we have, first, the "Bilious," when, in the words of the patent medicine pamphlet, "the liver is (was) king;" to us of middle age this experienced in our boyhood days, in the shape of treats to that delightful tasting stuff—mandrake—in decidedly appreciable quantities, or the volatile mercury, in doses however to us as results, certainly did belie this description of its, at least, physical properties. The old physicians of the present day have a practical remembrance of this age, and fully know the worth of the term "bilious" as a diagnostic appellation to satisfy the com-

munity at large, whether the condition was a case of bile excreted in too profuse quantity, or not at all; as this ever potent term was sufficient to lull the most tumultuous bosom to rest in quiet peace. However, this useful etiological factor served its time well, but as all things have an end, this was not an exception to the rule, and with the passage of time has now sunken almost into oblivion, except in patent medicine circulars, where its value is of tremendous import.

Then the second of these epochs appeared upon the scene with "Malaria" inscribed upon its banners. Becoming the common watchword and the cry, the why and the wherefore for every pain and ache, the cause of every ill to which mankind was heir, and quinine in massive doses was crammed into the unfortunate individual very much after the fashion of feeding the wretched fowl fattened for market by means of the stuffing process.

This period is within the recollections of many of us during our professional experience, and we can appreciate the tremendous support and mainstay that this portentous word has been to us; how it has helped us out of many quagmires of doubt, when the

admission of indecision or uncertainty would have been utter annihilation to our pride and dignity.

With the inevitable decline of this period has been the adoption of this term with a signification of an actual existing state, and not of meaningless import as originally used.

The third and most important etiological factor which has held sway ever since is "Uric Acid," greater than its predecessors, being founded upon genuine facts; in short, a real condition capable of producing much of the mischief laid at its doors, so much so that the use of this term, as a cause of disease, has not seemed to have partaken of the slip-shod character of diagnosis as the two former ever have. True, this agent in the past has been made a veritable pathological scape-goat for all the ills of humanity; the cause of everything we had or might have had; a cloak wherewith to cover our ignorance. But this is largely of the past, as uric acid as the cause of disease has been for some time settling into its proper place, as its predecessors have done; but owing to a position more stable and firmer than the others, this decline has not been so great, or its ultimate position as obscure or lowly, but simply to its

rightful sphere in the domain of pathology. That it will ever be relegated to the past, as has been the case with so much in medicine, is not at all likely, for as long as we have the present existing state of civilizing influences, together with the inactive life of the so-called better classes, this cannot but be ever present as an important etiological factor in disease.

Having passed through the various stages which every new theory or discovery in medicine has undergone; at first overestimated and overworked, extolled to the skies as potent for all ills; in fact, claims made for it far in excess of its capabilities; to be followed by the inevitable fall from grace, in which its former praise is turned into condemnation; exceptionally it has escaped this latter, but has surely come down from its heights of faddism to a mundane level, where it is possible for it to remain immutably fixed and permanently established for the future in the domain of medicine not subject to the change of opinion, a possibility of exceedingly frequent occurrence in the medical profession.

SYNONYMS.

Uricacidæmia.
Uricæmia.
Uric Acid Diathesis.
Lithæmia.
Lithiasis.
Lithuria.
Lithic Acid Diathesis.
Latent Gout.
Arthritic Diathesis.

DEFINITION.

Uricacidæmia is essentially a derangement of the process of metabolism; an impairment of the eliminative functions of the body; whereby certain excrementary substances are retained in the blood, setting up various disturbances, resulting in this condition. Characterized by manifestations of a decidedly protean character, simulating various other diseases, and acting as a toxic agent of different degrees of power, according to the amount retained in the system, and the susceptibility and temperament of the individual; those of the nervous being most susceptible, undoubtedly owing to its irritant action upon the nervous system.

True, it has been until recently a veritable medical scapegoat at whose door nearly all of the ills have been laid, when we could not find the true cause; its symptoms and influences probably in many cases largely exaggerated; still it is a bona fide etiological factor, a genuine pathological condition, its action thoroughly accounted for, and in every way worthy of the dignity of being considered a veritable disease.

It has at times been termed by the facetious or sarcastic the lazy man's disease, though in some ways not inappropriately, because the sedentary are so frequently the recipients of its action; but even so it does not follow that all others are exempt by any means, although non-activity is certainly not a cure for it.

A most widely prevalent and commonly existing complaint, being nowise a respecter of persons, attacking the wealthy devotee of fashion, who, by the way, spends two-thirds of the twenty-four hours in counteracting its effects so as to be able to eke pleasure and dissipation out of the remaining one-third; as well as the sedentary brain-worker and the closely-confined man of business; all being a victim of its pernicious effects.

The only class of humanity free from its bad results and escaping the attending consequences is the hard working son of toil, in whom the functions of metabolism are in such a complete working order that waste products in such have no chance to accumulate, but are rapidly and completely eliminated as soon as formed, as intended in the normal process of nature.

URICACIDÆMIA.

METABOLISM.

The ultimate normal object and end of all nutritive matter taken into the body is for the purpose of the building up of the tissues and the replenishment. of waste. This following upon the preparation of the food for assimilation by means of the digestive processes in the stomach and intestines; which passing from the latter through the lacteals and blood vessels, is carried to the various tissues to replace the never ceasing losses entailed upon them by the processes of life, besides in addition to this, in children and young people supplying the material for their bodily growth. A constant change going on in the

body by which the protoplasm of the cells is being destroyed and the new protoplasm built up by the assimilation of the food.

This process of life is resultant of waste material normally carried from the tissues by the blood, and by means of its several excretory functions, urine, perspiration, etc., is discharged from the body.

Regarded as a whole, these changes taking place in the human economy, from the assimilation of the food to the deliverance of the waste products to the organs of excretion, although complex and purely of a chemical nature, are characterized under the general term of "Metabolism."

Composed of two factors: Anabolism, or assimilation proper, a constructive process relating solely to the building up of the tissues; and Katabolism, a destructive process consisting of the combustion or breaking down of tissue

into a lower state of oxidation, with the consequent formation of waste products, as carbonic acid, water, and the various nitrogenous substances, urea, uric acid, etc. Those which concern us principally in this connection being confined solely to the nitrogenous, of which uric acid is the main factor, although it is claimed by some that there are also other bodies with it in exercising its deleterious influences. However, for all practical purposes we may assume this to be the one.

ORIGIN OF URIC ACID.

Uric Acid like urea is a waste product of the metabolism of nitrogenous principles, and varies entirely in quantity with the character of the food taken.

Of the several theories as to its origin, that of the liver being the seat is not well authenticated, as this organ contains but a small amount, and the blood in the hepatic vein containing no more than that which is conveyed to the liver by the portal vein. As it is found in considerable quantity in the spleen, and as the return blood from this gland must enter the liver, it would serve to explain the amount of uric acid emerging from the latter organ.

To the kidneys has also been attributed the function of the formation of this substance, but there is also a

lack of any positive data on this point. Another theory which has had many followers, is that uric acid, like the other constituents of the urine, is separated from the blood by means of the selective power of the epithelial cells lining the tubuli uriniferi of this organ. But the most generally accepted opinion, however, the most plausible as borne out by results and facts, seems to be in favor of the view that uric acid is formed within the tissues, and simply eliminated in the urine by the kidneys as a mechanical process, as far as it relates to them.

OCCURRENCE OF URIC ACID.

Uric Acid is a permanent constituent found in the urine in combination with sodium and ammonium, constituting the "acid urates;" is slightly soluble in water, but readily so in alkaline fluids, as the blood, and when separated from these bases, due to an excessive amount of uric acid, appears in the typical, whetstone, crystalline form resembling grains of Cayenne pepper. By some it is claimed to be ever present in the blood in varying amounts.

As to the normal proportion of the elimination of uric acid authorities differ, some giving five to eight grains per twenty-four hours on a vegetable diet, proportionately increased according to the amount of nitrogenous food ingested, about ten to fifteen grains in the same period.

While, according to Haig, it varies in proportion to the urea in the ratio of one to thirty-three; the urea ranging at from three to three and a-half grains per pound of body weight, which in a man of, say, one hundred and fifty pounds, would be somewhat over fifteen grains in the twenty-four hours. Therefore, as to this point, we can readily see that the subject is not as clear as one would wish for.

The amount of uric acid excreted will materially vary with the diet, but it is not the excretion of this product in its normal amount or excess that gives us any trouble, but its retention in the system that does so.

The occurrence of uric acid in the body in normal proportions is, of course, as we know, the result of the metabolistic functions, an excretory waste product; but when in excessive quantities constituting a pathological condition, is to be attributed to one of two causes.

1. A fault in the process of Katabolism, whereby the eliminative matter, the ultimate end of which should be urea, being by reason of some pathological process, this oxidation is not carried far enough, and as a result we have uric acid instead. Essentially constituting a pathological condition, or,

2. Simply an increased formation due to a diet largely consisting of nitrogenous substances; the uric acid derived therefrom, which not being properly eliminated on account of its excessive amount, or certain conditions existing which do not favor its excretion, accumulates in the body; an increased elimination taking place at times of quantities stored up in the past, and removed by the alkalinity of the blood. Partaking more of a purely physical process.

Haig and others deny the former of these, and claim that the latter is the

only cause. The writer is of the opinion that it is possible for both to be at times causative factors in this condition.

Uric acid being soluble in alkaline and insoluble in acid solutions, its presence in the blood would depend upon the reaction of that fluid, which condition is almost entirely influenced by the food taken, bodily exercise and temperature. In regard to which latter, exercise increases and cold diminishes the alkalinity.

Although uric acid may be ever present in the blood, still its quantity varies largely in the twenty-four hours, which, according to Haig, is in excess when the acidity of this fluid is low, from four or five in the morning to two in the afternoon. During which period the so-called "alkaline tide" occurs, about nine in the morning to twelve o'clock noon, when it is in an amount three-fold that of the other period.

The excess at this time not being due to any increase in formation, however, but simply an elimination of that retained or stored up during the other portions of the day, when the acidity is in excess, or, more properly expressed, the alkalinity is low.

The other period, from two o'clock in the afternoon to the early morning hours, is termed the "acid period," not that its reaction is at any time acid, but simply less alkaline, when the urates being rendered more insoluble they are in it in a lesser amount. This period is also influenced by diet, cold, etc., as is the other, and the quantity of uric acid also fluctuates, in which we find it from about three to six in the afternoon, to be less acid, and is sometimes termed in consequence the second alkaline tide.

These periods are of considerable importance in explaining the various phenomena occurring in cases of

uric-acidæmia, as the appearance of symptoms and other manifestations of this condition.

Exercise and work increase the alkalinity of the blood, bringing into it the uric acid, which if stored up in the tissues in any considerable amount is the cause of fatigue. Those who exercise most retain the least uric acid, and in such the storing up is little, if any, consequently their fatigue is but a minimum; but in the sedentary and inactive this is retained in large quantities and they therefore tire on the slightest exertion. For instance, gout, in which we have this storing up process at its maximum, seldom, if ever, attacks the laborer.

Cold and winter weather by diminishing the perspiration, there is a consequent retention of its acids in the system, therefore keeps the alkalinity of the blood low, whereby the uric acid retained in the body is driven into the

tissues, or, according to Haig, may also be thrown down in a colloid form in the blood when in too excessive quantity to be taken into them.

With high uric acid there is a low acidity and urea, also a diminished urinary secretion, its excess (uric acid) in the blood obstructing the circulation of the kidneys, thus preventing diuresis, and with which condition we have an accompanying high blood pressure.

Fevers cause acidity of the blood, with its attendant rapid combustion of the tissues; but in time, as the vitality of the system becomes worn out, this decreases and the blood becomes more alkaline. Resultant on this excess of stored up uric acid being excreted is to be attributed the various sequelæ of so common an occurrence.

EXCRETION OF URIC ACID.

Haig considers the absolute amount of uric acid excreted as of less importance than its relation to the urea passed, which, as we have said before, should be in the ratio of one to thirty-three, with the urea at three to three and a half grains per pound of body weight. The amount of uric acid eliminated in the urine is increased or diminished by the greater or lesser alkalinity of the blood, owing to its solubility under these circumstances.

An increase of this product is usual for a day or so after the administration of alkalies or sodium salicylate, presumed to be the uric acid stored up in the tissues and various organs, during which period it is to be found in increased quantity in the blood and the urine.

A diminution of the alkalinity of the blood for any length of time results in a diminished excretion of uric acid.

In youth there is always a minus excretion due to a lessened amount of waste products in the process of development, which at maturity is increased, while at old age the output is larger still.

In spring, especially, and summer a larger excretion occurs, as heat increases the alkalinity of the blood; decreasing in autumn and winter, as cold diminishes the alkalinity of this fluid, and, therefore, drives the uric acid into the tissues, except when present in an excessive amount, causing a condition of discomfort and sensitiveness to the cold so common in individuals suffering from this complaint (uricacidæmia).

Many persons, when the warm weather of spring comes on, suffer from malaise, fatigue on the least exertion, and a general feeling of wretch-

edness, attributed by certain elderly females versed in medical lore to sundry marvellous pathological causes, as "thickening of the blood," "spring blood humors," etc.; the true explanation being an accumulation of uric acid in the system during the cold months, due to confinement indoors, sedentary life, or a diet of too heavy a nature; consequently when the heat coming on and the blood becoming more alkaline this stored up product coming into it in increased quantities and being excreted causes a condition of at least discomfort, if not sometimes symptoms of a more serious nature.

All substances which increase the solubility of uric acid in the blood augment also its excretion in the urine, while all those which diminish its solubility by causing acidity or lowered alkalinity lessen, also its amount in the urine, driving it into the tissues and causing a condition of irritation to those susceptible to its influence.

In the latter class are to be included mineral acids, wines, beers, etc., which, as we know, cause gout by freeing the blood from the uric acid contained in it and sending it into the tissues and joints.

Certain drugs form soluble compounds with uric acid, or, by making the blood more alkaline, aid in its elimination through the kidneys, as the alkalies, sodium and potassium, also salicylic acid and the salicylates, and, when the alkalinity is low, salicin and salol also acting in this way.

Besides sodium phosphate, in a highly alkaline media only, as well as piperazine, quinine and belladonna, as also a vegetable diet, by diminishing the acidity.

In opposition to this we find certain other drugs forming insoluble compounds with uric acid, thus not allowing of its excretion, as the various acids, especially mineral; the metals, as iron,

lead, mercury, silver, copper, zinc, lithia, manganese, calcium; the sulphates, chlorides, etc., besides acid sodium phosphate; or else raising the acidity (lowering the alkalinity), therefore resulting in insoluble compounds, as opium, cocaine, iodides, antipyrin, ammonium, nitrates and various compounds of sulphur. These all diminish the excretion of uric acid by clearing it out of the blood and circulation, but bring about its retention in the tissues, joints, spleen, liver and other organs, resulting in a train of symptoms exactly the reverse of those experienced when it is retained in the blood. In fact, a condition of stimulation.

Even lithia as a solvent of uric acid, hitherto so highly extolled as a panacea for all conditions attributed to the retention of this product, according to Haig, while it removes the uric acid from the blood, never reaches this

substance itself, but by combining with the phosphates in the blood lessens its alkalinity, thus driving it into the system.

Likewise cold, fevers and alcoholic beverages cause a condition of acidity, holding back the urates in the tissues.

ETIOLOGY.

Uricacidæmia is essentially a disease of comparatively modern times, due to a pernicious mode and method of life, inactivity, diet, etc. The consequences and results of an imperfect excretion of the waste products in the act of living, either through an excess of nitrogenous substances taken into the system there ensues such an accumulation of these products whereby the oxidizing functions are overwhelmed and unable to dispose of them by excretion, or else a condition in which the metamorphosis in the human economy is not carried to completion through a fault in the chemical processes in the body; in other words, instead of urea, perfectly soluble and easily eliminated, the ultimate excretory and product of the metabolism of nitrogenous substances,

owing to an incomplete oxidation, they consist of uric acid, which, possessing different properties as to solubility, elimination, etc., is retained in the system, acting as an irritant to the various structures and organs.

Owing to what is termed an increased acidity of the blood, but in reality simply a diminished alkalinity, being unable to hold the uric acid salts in solution, a deposition of this substance takes place into the tissues, a condition of affairs we find in gout, and, according to Haig, also in rheumatism, two diseases which he claims to be identically the same as to their etiology, differing, as he considers, simply in the former being more localized and the latter more of a diffused character.

But the more common forms of uricacidæmia, however, are those derived from the presence of uric acid in the blood, its occurrence there due to an excess in the system, in an amount

not possible to permit this fluid to be free from it at any time.

To this condition Haig attributes an innumerable train of symptoms, also going so far as to make it an etiological factor for various actual diseases, as epilepsy, apoplexy, etc. While the more conservative would not feel willing to agree with him in all his reasonings and theories, still we cannot but admit that his explanations sound very plausible, and we are sometimes almost carried along with him in his surmises; but we must admit, however, that he supplies us with valuable etiological reasons for some conditions hitherto not accounted for, and while we at the present time do not admit all of his theories, still, however, much of them are to be accepted as of great value, as supplying many missing links in the etiology of disease.

Of importance as a causative factor in this condition is an inherited

tendency on the part of some, derived especially through gouty parents, the transmission by the male side being more common, manifesting itself by means of the various symptoms characteristic of this condition.

In such cases we have most assuredly what has been termed a "uric acid diathesis," denied by some as not existing, among whom Haig being one who disputes it.

Among the causes of this condition we will find anything which tends to promote a sluggishness of the process of assimilation and excretion.

The most important of which in contributing their share, we may mention, a sedentary, inactive life as tending to lower the par of the system, too much confinement indoors, with insufficient fresh air, practically starving the blood of the necessary oxygen for the complete metamorphosis of this product into urea, which, being deprived of it,

thereupon seizes upon what is available in the blood corpuscles.

Errors in diet and excess of food are also attributed as a cause, possibly due to their natural impairment of the health, rendering the subject susceptible to, in fact, any deleterious influences.

A neurotic temperament and too much worry we would expect to predispose an individual to a condition so liable to arise from a cause of such an irritating nature to the nervous system.

Inasmuch as sufferers from this condition are usually worse in cold weather, this has been given as one of the causative factors; but, unless the blood of the subject is pretty well charged with uric acid, I do not think he would be likely to be influenced by low temperature, rather, according to Haig, it would, if but in small quantities, be removed from the blood, but if present in large amounts would be precipitated in it, as he expresses, in "colloid" form.

Another cause that has been advanced is too little water drinking, which it seems hard for us to realize how this could be; and also the use of alcohol and tobacco is accredited by some as producing this condition.

As to the action of tobacco in this state, it does not seem to be well understood, and as to alcoholic beverages we know that they cause a lessening of the alkalinity of the blood, driving the uric acid into the tissues, especially so in the case of rich wines, as port, sherry, champagne and burgundy, also malt liquors and porter. Spirits having the least prejudicial effect.

But the principal and most common factor in producing this trouble, is an excess diet of animal food, of which beef is the most pernicious, together with the xanthins, tea, coffee, etc. Yielding as they do a large amount of nitrogenous matter, which, if partaken of in too great a quantity, taxes the

metabolistic functions to an extent not possible to effect a complete conversion of the products into urea, but stopping short at a lower grade of oxidation—uric acid.

SYMPTOMS AND PATHOLOGY.

We cannot but admit that the evidence is pretty strong to lead us to believe that a large number of diseases of the human body owe their causation to the effect of uric acid, which by its controlling action upon the circulation, as well as its irritant properties, exercises a deleterious power over the processes of life to a very great extent. That it is a possible cause of many pathological conditions although not the only one.

Its pathological action being due to two factors, viz.:

1. The direct irritant effect on the tissues owing to its presence in them in considerable quantity, as we find in gout or rheumatism.

2. Its presence in the blood, obstructing the capillaries through the vasomotor system; affecting the circulation,

nutrition, function, and temperature of all the organs and tissues of the body; also producing high blood pressure which directly affects the heart and vessel walls, as well as the intracranial, thoracic, and chylopoetic circulations.

The presence of uric acid in the blood causes an increased arterial pressure, with slowness of the pulse (brachycardia), attributed by Haig to an actual plugging or occluding of the smaller capillaries by this substance in a form termed by him "colloid" uric acid; but this savors so much of the etiological factors of a century ago, that a more satisfactory theory should be sought for. The writer is of the opinion that its influence on the blood pressure is really due to uric acid in this fluid, irrespective of form, either colloid or crystal, but without doubt at all times in solution when in it, and acting as an irritant to the vaso-motor nerves, causing a spasmodic condition of the muscular coats

of the vessels, thus bringing about the same results in a lessening of their calibre, interfering with the circulation, deranging nutrition and resulting in structural changes, controlling the heart's action by slowing the pulse, and ultimately resulting in cardiac hypertrophy; interfering with the action of the renal and pulmonary circulation, with also headache and depression, and from the impairment of nutrition and metabolism a resulting anæmia and hæmoglobinuria.

The various manifestations of the presence of this product in the blood are not in all cases continual, but owing to an excess accumulation in this fluid and the system being unable to dispose of it, we have what are termed "uric acid storms;" the location of the trouble depending, it would seem, largely upon the local susceptibility of the patient; attacking as a rule at the weakest point. These attacks being

followed by the elimination of these offending waste products, with a consequent fall of blood pressure, diuresis, and subsidence of the symptoms and a temporary lull, during which time the capillaries thus freed is followed by a quickened metabolism and combustion, a comparative feeling of well being and apparent immunity from disturbing symptoms; these periods varying as to length, during which time the uric acid is again accumulating, and when the system is again overloaded with this product to recur again, and so on repeatedly, until effective treatment is instituted or the patient gives out.

On the other hand, in some we find a lesser variation of the condition, with a more or less continual state of malaise, depression, wretchedness, etc.

The non-elimination of such a seemingly trivial quantity as six to seven grains—or even fifteen grains, according

to Haig—of this excretory product in twenty-four hours would seem but a small matter, but when this keeps piling upon itself for days and even weeks or months—possibly years—we can readily understand why the system becomes so thoroughly saturated, and it is, therefore, no matter of surprise to us that it causes all the trouble attributed to it.

The action of the uric acid on the human economy (in a simile by Burnett) is identical with that of the soot in our chimneys (we would suggest also that of clinkers), interfering with the well behavior of our stoves, or in case of those of us who have to endure it, that very essential article to our comfort, but, at the same time, hygienic bane of civilization, the hot air furnace, the cause of the majority of the catarrhal and neurotic evils with which we are afflicted.

Without doubt a heavy eater of

nitrogenous food actively engaged in an occupation which keeps his excretory functions in perfect working order; his urine might show an amount of urea and uric acid far in excss of the normal amount, and yet the individual, at the same time, enjoying perfect health; but take a person of sedentary habits on even a moderate nitrogenous diet, where the urine shows an amount of urea and uric acid not above the normal, and symptoms of its retention will seldom be absent, due to accumulations of it in the system. If in a patient of a neurotic temperament or a tendency to the much scouted at uric acid diathesis, the conditions will be more aggravated still.

Although this complaint is possible in all, still the individual in whom uricacidæmia most frequently occurs is usually of a neurotic tendency, non-active and sedentary, susceptible to cold, with a deranged digestion and very often badly working kidneys;

with a lowered vitality and deficiency of hæmoglobin in the blood.

In the normal subject the consumption of hæmoglobin being considerable, the demand for it is, therefore, large; the uric acid of the waste products by means of this substance being oxidized into urea, as more soluble and of easier elimination; therefore, when this product is in excess, a greater tax is levied on the blood in its oxygenating functions, in which case accounts for the resulting and ever present anæmic condition.

In fact, a constant destruction of the red blood corpuscles in a varying degree of severity.

The excretory functions, therefore, taxed to their utmost by the increased amount of this product, and usually inadequate to the task, the result of the existing high arterial tension and pressure, as well as also the general impairment of the health; its elimination

is thrown upon the liver and kidneys with consequent derangements of these organs, often of a serious nature, as hepatic cirrhosis, biliary or renal calculi, albuminuria, interstitial nephritis, etc.

As a rule, in all these conditions of uricacidæmia we have present symptoms of nervous irritation, as various forms of neuralgia, mental depression, irritability, and bad temper, insomnia, weak memory, worrying and annoyance, also numbness of the extremities, etc.

This, together with the deficiency of hæmoglobin, and the small amount of heat generated and consequently but little radiated, renders the subject susceptible to cold, all huddled up and afraid of the slightest breath of air, from which exposure to, a cold is invariably the result, and with this consequent lack of reserve vitality making him unable to throw it off, therefore hanging on for an indefinite and protracted period.

Gout is a condition resulting from uric acid, and, according to Haig, rheumatism also, the two closely allied; the difference being that in the former occurring in but one joint, of longer duration and severity with a deposition into its tissues of biurates; while in the latter it occurs in several joints, is of shorter duration, of less severity, and the urates are present in the tissues in solution; the pain worse at night on account of the acidity (less alkalinity) of the blood, when at that period it is driven into the tissues. Besides in gout, although there is a diminished alkalinity of the blood, there is not a general clearing out of the uric acid from it, while in rheumatism the uric acid is all driven out of this fluid, the reaction of which is also less alkaline, but is in the tissues a short time only and not in crystalline form.

Gout seldom attacks those engaged in bodily labor or on a vegetable diet,

but as rheumatism, however, does very frequently occur in the working classes this, therefore, constituting a weak point in his theory.

As these diseases do not often appear until the individual is advanced in years is accounted for by an accumulation of uric acid in the system from a previous diet of meat, tea, coffee, wine, beer, etc., manifesting its presence at this late date.

Malaise, disinclination to do anything, and fatigue on the slightest exertion, caused by the fact that exercise and motion increase the alkalinity of the blood, when the uric acid stored up in the tissues, being soluble in this menstruum, therefore its invasion into it with the production of these symptoms.

Exposure to cold when the blood contains uric acid, if in small amount, drives it into the tissues, but in case it is in excess and not possible to remove

all from it produce various disturbances, as lumbago, pharyngitis, bronchitis, tonsillitis, rhinitis, etc.; in fact, attacking that part of the body which is the least resistant to its influence.

Therefore in an individual loaded with uric acid a cold climate is most effectual in producing a defective working of the various functions and a faulty metabolism.

In warm weather the attacks from uricacidæmia will be less frequent owing to the fact that warmth is conducive to alkalinity of the blood and an increase in the excretion of the urates.

For this reason when the first warm weather comes on after winter there is such a general sense of malaise and that "tired feeling," in a more or less degree, as we have stored up uric acid during the cold months from a diet too heavy for our insufficient inactivity; while those who have not accumulated

this product in the system have little or no depression at this time.

As to the effects of cold on a system full of uric acid, its precipitating action will cause trouble when large quantities are retained in the blood, exercising a paralyzing effect upon the circulation, nutrition and metabolism, accompanied by mental depression and an exceeding sensitiveness to the cold. When, however, but little uric acid is in the system cold acts as a stimulant, raising the acidity of the urine, lowering the alkalinity of the blood, and therefore clearing it of these waste products contained in it, thus stimulating nutrition and metabolism; consequently those who live on a diet free from uric acid feel the cold less and require less clothing in winter than those who eat much meat and xanthin compounds.

Frequently we meet persons who complain, as they express it, of "feeling wretched," or else their symptoms

are worse, during the early part of the day, but during the afternoon begin to feel better, and by night time feel perfectly well, this occurring repeatedly; also in cases of deranged digestion, where the evening meal is best borne, the others causing considerable disturbance, especially that at midday, so much so that total abstinence from food at this time is sometimes compulsory.

This is to be accounted for from the fact that during the morning hours the increased excretion of uric acid takes place, which, if excessive, is the cause of this trouble; while in the afternoon and evening, due to lowered alkalinity, it is present in the blood in but very small quantities, hence the apparently stimulating effect of mental activity and well being.

One of the most common and frequently complained of symptoms is headache, paroxysmal or periodic; identical with migraine, bilious or sick

headache, so-called, lasting twelve to forty-eight hours, accompanied by nausea, vomiting, coldness, chilliness, etc., the patient going to sleep and awakening in the morning free from it. Often in females, occurring around or at the menstrual period. These are practically "uric acid storms," due to the overflow of a storing up of this product and its consequent passage through the blood out of the system, which, when all excreted, the headache passes away and does not return until a new supply has accumulated, when another storm ensues. These occurring more frequently in individuals with large supply arteries in the brain; as a rule, the intellectual and brain workers (although the ignorant are not exempt), also those of sedentary occupation; in fact, those whose cerebral vessels are of greater extent and calibre, with slow high tension pulse, accompanied by coldness of the skin and extremities,

brought on by some extra exertion or muscular effort or after fatigue.

Also from crowded assemblages, churches, theatres, etc., poorly ventilated, due to the heat and deficiency, increasing the alkalinity of the blood, when uric acid if present in the system enters into it.

In regard to the above it would seem that churches are a more prolific causative factor, on account of a tendency to neglect to the important hygienic principle of ventilation. Theatres are less so on account of the large stage, making it impossible to exclude air entirely from them, and therefore less liable to be a cause of this trouble.

Bearing upon this subject, inasmuch as these complaints are quite frequent, the writer has in view a church at which he knows an individual who has attended there frequently, but if mornings, in few cases without being laid up the rest of the day with sick headache;

also, he recalls the case of a lady who has been obliged to stop her attendance there, as invariably on doing so she would faint away during the services. In a conversation with one of the employees, he innocently informed the above party that during the cold season they seldom permitted the fresh air to enter the building; as when they attempted to warm it again, as he expressed it, the hot air all went up to the top and it took too much coal.

Verily, a modern "Black Hole of Calcutta," in a mild way.

Possibly the question of ventilation in our churches may have something to do with the non-attendance of which we hear so many complaints.

It is certainly the cause of the drowsiness that so many experience.

This plea of headache on attending church has been sneered at and scouted at by many, but the writer knows there is more truth in it than the doubting ones would have us believe.

The presence of uric acid in the blood causing, as previously explained, a raising of the arterial pressure, symptoms of this will of necessity manifest themselves. When the respiratory organs are the susceptible parts, asthma is often present; the attacks when coming on in the early morning hours, as is so frequently the case, due to low blood pressure, free capillaries and quick pulse of the night; with the "acid tide" of the blood; giving place to the high blood pressure; obstructed capillaries and slow pulse of early morning; the "alkaline tide" of this period.

In fact, the exacerbation of all symptoms and conditions so frequent at this period in the twenty-four hours, we here find a ready and satisfactory explanation, for inasmuch as this has hitherto been unaccounted for in any way to meet the requirements of a mind seeking for the why and wherefore.

Also as a result of the continued high tension, derangements of the circulation are apt to occur, as arteriosclerosis, and later, various cardiac lesions, especially hypertrophy. Angina pectoris is also a symptom attributed to this condition.

The increased labor put upon the kidneys in the elimination of the excess waste products, together with the high arterial tension, if allowed to continue, as a result ultimately we will have a diseased condition of these organs, albuminuria, interstitial nephritis, etc.

But the amount of excretion should not influence us in an opinion, as in a healthy kidney with low alkalinity of the blood, the uric acid may be very scanty, leading us to infer that this organ is diseased, which under some conditions, when so, may excrete a considerable amount.

Haig, who, as I said before, attributes

to this condition a very large number of ailments to which humanity is heir, also considers this a causative factor in epilepsy, convulsions, hysteria, and like ailments, due to an interference of the cerebral circulation on account of the high blood pressure. To this he also attributes diabetes, glycosuria, and Raynaud's disease (symmetrical gangrene), the early stages of which are so characteristic of uricacidæmia with its cold extremities, etc.

Regarding which it would seem that inasmuch as his arguments are, as a rule, the most plausible of any hitherto advanced for them so far, we would not be making a very great mistake in accepting them, at least for the time until something better turns up.

In individuals with a weak digestive tract of necessity this will here cause trouble from attacks of indigestion, more or less protracted and of varying degrees of severity.

In some, cutaneous manifestations will occur, as urticaria, eczema, etc.

Those with weak respiratory mucous membranes will also not be allowed to escape the effects of this agent, and in the nose we will find frequently a neurotic rhinitis, and a condition of the turbinals in which on the slightest provocation a congestion will occur, occluding the nostrils and causing the individual an amount of annoyance not appreciated except by those so affected in this manner.

Uric acid is considered to be one of the causes, by some the one, of hay fever; of both the neurotic condition necessary for it, as well as also that of the hyperæsthesia of the mucous membrane, rendering it susceptible to the local irritant setting up this condition.

Enlarged tonsils and also lymphoid enlargement of the pharyngeal tonsil are by some attributed to an inherited gouty diathesis.

In regard to the character of the symptoms developing as a manifestion of the presence of uric acid in the blood, the writer is of the opinion that according to the temperament of the individual so will these be.

In the so-called sanguine or full blooded we will find derangements of the circulatory system, as congestive headaches, cardiac and kidney lesions, arteriosclerosis, and also gout.

In the nervous temperament various neuralgias, and especially in these individuals do we find affected with hay fever and the several respiratory neuroses, as asthma, neurotic rhinitis, etc.

In the bilious temperament lies the susceptibility to sick headaches, also many liver, spleen and gastric troubles.

The phlegmatic temperament seems to be less susceptible to the influences of uric acid than any of the others, yet why is not clear, as persons with this temperament are, as a rule, prone to

inactivity, even sometimes laziness in the highest degree, and very often large eaters, both of which being potent factors in the production of the uric acid condition; therefore why this class of individuals should be free from its effects has not yet been explained. Possibly for the reason that their excretory functions are, as a rule, more active, bowels more open, skin perspiring more profusely, and kidneys free, thus rapidly eliminating this product as soon as it is formed and not allowing it to accumulate, is the only explanation it seems possible to offer at present.

TREATMENT.

General Remarks.

In the treatment of uricacidæmia drugs, although useful as far as they go, have but a limited sphere of action in this condition, and while efficient agents when used at the proper time and place, still are of lesser importance compared with the various hygienic factors, which we will soon discuss as to their use in this complaint.

To cure our patient suffering from this trouble more than a mere prescription and some general platitudinic advice is necessary as to the regulation of his mode of life; but to be successful in leading him along the path to beneficial results, at least, if not perfect recovery, the slightest detail of his living must be arranged and regulated for

him, if he will not follow out and conform to the advice given him by the physician, in case of failure the fault will then be his only, for in the instructions given him for his cure, if sufficiently explicit, the physician will have then done his duty. More than this would not be possible.

However, if we neglect this more important part of the treatment we are most certainly derelict in our duty, no matter how much as an offset we ply him with drugs, for with these alone no permanently curative results need be expected.

Our principles and mode of life should not influence us as to what is hygienic unless we ourselves conform to its regular adopted principles as according to authorities on this subject. In short, we must prescribe genuine hygienic principles for our patients and not fads of our own concocting. For instance, the healthfulness of

alcohol and tobacco never has been a fact, although some of us use them and live through the effects; even it may be that we have had an ancestor in days gone by who was addicted to the practice of these agents in large quantities and yet lived to the age of ninety years or thereabouts. Without doubt if this same party had cultivated better habits he would have lived to over a hundred.

In uricacidæmia we have a condition of toxæmia, a poison in the blood, being continually introduced by means of our diet, with two-fold indications for treatment; firstly, to eliminate the waste products that are present in the system in excess; and secondly, to prevent the new supply from coming in; and until this is done the trouble will not cease.

Cures are not, as a rule, possible, that is, to alter the life processes of the individual so that he can return to his former unhygienic way of living without suffering inconvenience again or

the old symptoms returning, but by the change of injurious habits to those of a healthful nature, very few cases, if not all, will experience more or less relief, prevented only according to the amount of structural change that has taken place, and in these cases where this has not occurred we may hope for a complete return to health.

But that the cure of this condition by drugs alone is possible, is about as reasonable to expect as that a fracture or the removal of a foreign body treated only by internal medication, without any mechanical procedures, can be accomplished successfully.

Ever remembering the above indications in the treatment of uricacidæmia, elimination of the excessive waste products, and prevention of their reformation; when this is accomplished, then by means of drugs treat the symptoms arising, when we will find our remedies to come into play and with gratifying results.

TREATMENT.

HYGIENIC.

Under this head we will include as essentials in the treatment of uricacidæmia, the following factors: Exercise, Baths, Clothing, Air, Climate.

Exercise. We may not follow out this principle ourselves, or insist upon it in our patients, save in a casual way suggesting it to them as an optional matter; but none of us will deny that proper exercise is absolutely necessary to perfect health, and for the proper performance of the functions of life; quickening the circulation and increasing its flow throughout the body, augmenting the respiratory process by causing an enlarged demand for oxygen and the expulsion of carbon di-oxide, also hastening and aiding the elimina-

tion of the waste products of the body, by means of the various excretions, as the urine, perspiration, etc.

In health this is necessary to keep well, and even in the invalid, as much as he can take without fatigue, is advisable; but when we crowd exercise unlimited, as is advised by the majority of the laity and many physicians, upon an individual full of uric acid and unable to dispose of the already increased amount of this waste product in the system, we by means of the formation of more, through this additional exercise, instead of bettering, as is intended, simply aggravate the condition.

Physical exercise creates a demand for hæmoglobin which at this time the debilitated system cannot supply, also increasing the quantity of toxic waste products, which, not being rapidly eliminated, the patient consequently suffers from the bad effects, besides

draining his vitality and with a non-resisting recuperative power causing the resulting condition.

A mild systematic exercise in the open air is not only beneficial but absolutely essential, but not to be carried beyond the balance of repair and waste, no further than the stage of slight fatigue, increasing daily if possible until a considerable amount can be indulged in without tiring the patient, ever making an effort to enlarge his powers of endurance.

In this, however, we cannot hope for any success until the uric acid is out of the system. This accomplished, and its recurrence prevented, then our exercise is a valuable prophylactic and remedial measure, and not a means of aggravating the evil, as it would be if used alone as a mode of treatment as is so commonly advised.

Baths are necessary to stimulate the skin to its normal functional activity,

also to keep open the excretory ducts. For the first of these cold, always followed by friction, is considered preferable; but for the second, which is synonymous with cleanliness, warm water is necessary.

In weak, debilitated subjects the cold bath is not advisable on account of its depressing effects upon the heart, and the non-liability to an early reaction. In patients who are cold, chilly, and feel bad for several hours after, this should be avoided, but in a case where an exhilaration and well being follows immediately after the bath they may be allowed.

As a rule, however, for the uric acid patient, warm baths will be more often required, as the action of cold on this product acid being to cause its retention, the very thing we wish to avoid.

On account of the liability to take cold afterwards, they are, therefore, preferable at night before going to bed.

For those who must have their morning cold bath, either from an exaggerated sense of cleanliness, or in whom a tonic and exhilarating effect is really produced, I would strongly advise in lieu of this that a sponge bath is all sufficient, invariably followed by a brisk rubbing with a crash towel,which is followed by a glowing feeling and a sense of warmth, we may safely allow such; but in the stage of uricacidæmia this mode of bathing is not advisable until in the patient, the stored up products are eliminated and the increased formation has been stopped.

Remembering that cold checks the elimination of uric acid, which outflow being greatest during the morning hours, the cold morning bath will tend to interfere with this excretion, and even though the patient may feel well after it, should a sense of discomfort, wretchedness and depression occur during the afternoon hours, due to an

excessive deferred action at this time, we may infer that uric acid is being retained in the system as a result of this, and therefore the cold morning bath should be discontinued. This may account for the afternoon nap so obligatory to some individuals, although apparently unnecessary from their slight exertions.

The pernicious practice of the cold plunge bath, introduced by the few and followed in a lamb-like way by the many, simply because it is a fad; cannot but be condemned for general adoption by the average individual of the present day.

I verily believe that the increased prevalence of cardiac and renal diseases is due to the wholesale and indiscriminate indulgence in this practice, especially on the part of adults; although the young and hardy may be able to withstand its entailed strain upon the system.

By its action driving the blood from the surface, thereby congesting the internal organs, this cannot but be injurious to them, and with any tendency to weakness on their part, serious derangements are liable to result therefrom.

That certain strong and hearty individuals who indulge in them and seem well is not by any means indicative of their healthfulness, but simply that they are hardy enough to endure the continued strain.

It is a significant fact, however, that as so many of these apparently robust and strong ones pass out of the world so suddenly from kidney and heart diseases, generally like the snuffing out of a candle, it has occurred to the writer to ask the question, could not this be a means of possibly contributing towards this result?

The baths should be taken as hot as the patient can comfortably bear them,

and quite frequently; subjects well charged with uric acid are often benefited by one every night, but in all cases it should be tried, when if no debilitating results occur it should be kept up until symptoms of excessive retention of uric acid disappear, when they may be gradually lessened.

Clothing is another point of importance to be looked after at all times. Woolen underwear, preferably Jaeger's, should be worn next to the skin all the year round, varying in thickness according to the season.

Silk or other material, no matter how much advertised or highly puffed up—even if more expensive—will not take its place. I fully agree with one of our authorities—I forget who—who, in writing on this subject, expressed his opinion as to silk underwear, that its preference by so many he attributed solely to its costliness.

Air must be fresh, pure, and in

abundance at all times, night and day. The patient must sleep in a well ventilated room, as cold as he can do so with comfort and no resultant bad feelings in the morning on awaking.

During the day in the case of weak and debilitated subjects, avoiding any exposure to cold before, say, two o'clock, in cold weather remaining indoors until this time; this is advisable so as not to interfere with the normal process of the "alkaline tide."

The apartments through the day should also be provided with good ventilation, and in cold weather not heated by steam, or if so, a pan of water should be kept boiling in the room to relieve the excessive dryness resultant on this mode of heating. In some ways I think the hot-air furnace is worse; not so much on account of the dryness, which is bad enough, as from the fact that it seems about impossible to have one so regulated as to run even throughout

the day; it being the usual thing to shiver and shake in the early morning hours, possibly be comfortable during the middle of the day, and at night to swelter from too much heat, just the very time it is not wanted.

In this I think a large majority of persons will agree with me as to their experience with the hot-air furnace, occasionally there being a few exceptions.

Besides a gas-tight furnace is practically an impossibility; consequently the air we breathe, when one of these is in operation in our house, contains at all times in a more or less dilute form such delectable bodies as carbon monoxide, and dioxide, together with hydrogen sulphide, all highly poisonous gases, and our only salvation being that they are usually present in but small quantities; but even then enough so to be deleterious to our health, making us feel wretched and disinclined to work.

The ideal method for all who can afford it is by means of hot water, as near perfection as we can ever hope to reach in this world, insuring us at least a complete immunity from poisonous gases from this source, and besides granting us a equable temperature at all times.

Of course, I refer to these means of heating in our cold climate with our disagreeable winters, as where a wood fire is sufficient it is the most hygienic form of heating, next to it being the grate fire; these being the methods preferable to all others. Stoves are but makeshifts, and not to be advised at any time, except when nothing else is available, and being a case of necessity knows no law, the individual who has to endure them is to be most heartily pitied.

For these class of cases an outdoor life, as much as possible, should be indulged in. This cannot always be

carried out to an extent really necessary to our usually severe winter climates; and even our springs of late have been a travesty on the term as usually understood, viz.: sunshine, singing birds, blossoming flowers, etc., etc.; but in the summer months and early fall, even late spring, when possible to do so, the patient should remain out of doors all day, and at night in a room well ventilated.

In a country perfectly healthy, a dry air, free from dampness, camping out is to be advised as most beneficial in every way.

Individuals not able to exercise should sit or lie in a hammock in the open air, of course not exposed to draughts or wind, but in sheltered and shaded situation.

In short, fresh air in abundance at all times is an absolute essential to supply the anæmic blood its oxygen, with as little effort on the part of the system

as possible, and in a pure and unadulterated form.

Climate is by no means of minor importance, as few of these cases but what a change of air is absolutely necessary for their recovery if their condition is beyond that of medium severity; in fact, all will be benefited.

Inasmuch as the uricacidæmic patient, as a rule, is also a neurasthenic, as well as being the possessor of a weak heart, a seashore or a mountainous region for aggravated forms of this complaint are both contraindicated, the former on account of its too stimulating properties, the latter due to its bad effect upon the heart; but what we would advise in this condition is a healthy hill country, with an altitude sufficient to insure a fresh, bracing quality to the air, but not high enough to tax the heart.

An altitude of ten to twelve hundred feet above sea level seems to the writer

about right for such cases as these. Another important point to be taken into consideration is the avoidance of great contrasts between the night and day temperature, the prevalence of sudden changes and also the liability to cold or hot "snaps." Of course, these conditions will occur in all portions of the globe to some extent, more or less; but our endeavor should be to find a place where the lesser changes prevail, and such is more apt to be in a medium altitude than in the extremes.

No doubt there are innumerable locations to fill these requirements, but the difficulty is to find them when we need them; in fact, when in a hurry we have not the time to look them up and must take what is recommended to us, sometimes to our exceeding regret and discomfort.

Having spent many seasons there, the writer has ever been of the opinion that to largely satisfy the

requirements of an individual suffering from an aggravated form of uricacidæmia the country around Sharon, Connecticut, is perfectly suitable and conducive to good results for cases of this complaint; often while invalids, in fact though not apparently so, but who need a quiet country life with city comforts, minus its bad air, smells, noise and other characteristic features of a disagreeable nature, Sharon is fully adapted for them in every way. Situated in the hills of Northern Connecticut, at the beginning of the Berkshire range, it possesses all the well-known features of this famous region, without quite so much of the "civilizing" influences of the resorts farther north in this section apt to annoy and grate on one with sensitive nerves and easily irritated. It is quite well known as a resort and possesses good accommodation for all desiring to avail themselves of its beauties. Is usually filled to overflow-

ing during the summer months, but owing to the class of people going there one would never be inclined to think this the case, not by any means lonely, but simply that one is not encroached upon in fact or visually by the species of individuals so common in most of our summer resorts. Besides not being a business centre or having any manufacturing interests, it is possible for it to be what it appears to all who have ever been there, an ideal New England town, remarkably beautiful and exceedingly healthy. Its situation being little over two miles back from the railroad station, it is possible for it to maintain its freedom from too much of the "progress" so common to the majority of our towns.

From this description the writer disclaims any intention of advertising this place, but simply to make known a desirable spot for a summer resting, one where we do not have to pay the

penalty of expiating all winter for unhygienic conditions experienced, and so common to many of us after our summer sojourn in pursuit of health and pleasure.

For a class of cases who not only can stand but may need the stimulating climate of a higher altitude, besides also a certain amount of social enjoyment, I do not know of a location more desirable than Lake Minnewaska, situated at an altitude of about two thousand feet above sea level, where we have a genuine mountain climate amidst beautiful surroundings, both near and far, with many advantages not obtained at other resorts, and entirely free from the turmoil and bustle found at the majority of the summer resorts, especially those but a short distance from the cities.

For parties but slightly affected and well enough to travel, the White Mountain region is a more desirable section

to recuperate in, of which there are many points to settle at, Bethlehem being considered the centre.

In the case of patients with asthmatic complications a high altitude may be necessary, but if in any of the conditions insomnia is induced, it is indicative that the heart is being affected and that a lower altitude is to be sought at once.

A certain proportion of these cases do better at the seashore, and for such where a mild salt climate is desired I know of none better than the Connecticut shore of Long Island Sound as possessing a balm-like quality, and exceptionally free from all irritating properties of so frequent occurrence in many of our sea shore climates.

For a genuine pure and unadulterated seashore with a climate possessing qualities fully equal to an ocean voyage, all this is attributed to the coast of Maine and the islands of Casco Bay.

But the seashore resorts near the city are the very last places for us to send a patient requiring quiet and absence of irritating influences, with their noise and confusion, as staying at home would be of much less injury to them.

Long Island with its grand expanse of ocean and endless opportunities for the sportsman, besides an object on which much money has been lavished not always wisely, is not a location for us to send our patients to for many hygienic reasons. This may savor of heresy to the decrees of fashion, to the devotees of which this section of country is a veritable Mecca.

The writer does not wish to be understood as claiming that the places here enumerated are the only locations in which the debilitated and enfeebled may again become strong and well, but simply in his opinion as advisable to recommend to our patients when in need of such.

Bowels. A tendency towards constipation should not be allowed. One daily movement of the bowels, at least, should be invariably encouraged, either by habit, diet, enema, or even as a last resort by means of drugs.

Rest. Early hours for sleep should be enforced; not less than nine hours out of the twenty-four being essential in these cases, and even more in the very debilitated; but as a rule, preferably at the regular sleeping time, unless in the very weak, so as to allow of the opportunity to derive as much benefit from the sunshine, fresh air, etc., during the day.

Recreation. A very important point to gain with these patients is to draw their attention away from thinking too much of their ailments, either by means of some agreeable occupation or some easy outdoor work, even to the cultivation of a simple "hobby" to keep them engaged and their minds diverted, to

prevent a brooding over their bad feelings and their complaints.

This point gained, much will have been accomplished as a means of remedying the evil.

Water. As to this a water with as little solids as possible is the most desirable, and that containing lime and iron in too large quantities is apt to cause an aggravation of this trouble and is to be especially avoided. Pure water must be ever considered an absolute essential to the maintenance of perfect health.

TREATMENT.

DIET.

This is without doubt the most essential factor in the treatment of this condition, as by these means the quantity of waste products in the system can be either increased or diminished; its alteration easily effected and in a short time so acting on the excretion of the uric acid, a diminution of the nitrogenous or xanthin diet lessening its formation; but to remove the present accumulations resulting from the past, if in any considerable quantity, is a matter of months at the very least, if not years.

The diet of the uricacidæmic patient should consist of no articles containing uric acid or any nitrogenous matter from which this substance can be

formed, as animal food, fish, etc., and in some cases even eggs; nor should the xanthin bodies, tea, coffee, or cocoa,—substances which in their passage through the human body become converted into uric acid—be permitted at all under any circumstances whatever.

A diet as the above, stimulating as it is, by rendering the blood acid (less alkaline), keeps the uric acid out of it; therefore, although the patient may feel well during the intervals, when the system becomes too overcharged with the waste products, as it surely will, then due to its overflow and increased excretion, we have the so-called "uric acid storms," as headache, bilious attacks, etc., a change of diet is absolutely essential.

Animal food not being absolutely essential for perfect nutrition, this end can be attained by means of the vegetable kingdom, although of a necessarily bulky nature on account of the

larger amount required, there being a lower proportion of albuminoids present in them, as also water.

Milk and cheese have no power in increasing the formation of uric acid, and on account of their valuable nutritive properties may be used as a substitute for animal food.

However, a diet will be necessary to provide enough nitrogen to keep the area at three and a-half grains per pound of body weight during the twenty-four hours—no more or no less —estimating the patient's weight minus fat, *i. e.*, what he weighed before becoming fat, if so. The determination of this substance may be made with the Doremus Ureometer as of sufficient accuracy; but for uric acid, the process being tedious and complicated, is not adapted for the busy practitioner's use. The determination of the urea, however, will be sufficient, and by this means we may be enabled to keep track

of the patient's condition, and as it is also necessary to maintain the proper body nourishment to prevent the loss of flesh and strength, with the animal foods left off, this must be replaced by other substances containing albuminates; as, for instance, milk with a percentage of three to four per cent., cheese thirty-three, peas or beans twenty-two, bread eight, and oat meal twelve; taking of these an equal quantity of peas, beans or cheese, or of the others in an amount proportionate, any of these will fully replace meat with its average of twenty to twenty-five per cent. of albuminoids, supplying an equivalent as satisfying and efficient.

By these means we are thus enabled to maintain the urea in proper quantity, together with the nutrition and strength not at all affected.

Should the bulkiness of this form of diet produce dyspeptic symptoms or gastric derangements, or, for variety,

the various gluten preparations will be found of inestimable value as foods.

There may be cases met with, very rarely however, where these articles of diet do not seem to be sufficiently nourishing, where the patient loses strength; in which case we may be compelled to allow the use of such articles as fish, chicken (turkey is not advisable), eggs, etc., but endeavor to have the patient avoid all red meats as much as possible, and only use them under the most urgent circumstances.

This outlined diet is that recommended for the most severe cases; but in the milder forms, although best without, still meat once a day may be allowed, but tea and coffee should be abstained from entirely, until at least the patient is free from all troublesome symptoms and the urine is free from an excess of urea, when coffee once a day, not too strong, may be permitted; but tea at no time should be taken as a beverage.

As to meat, in these individuals, at no time should they eat it more than once a day, even when apparently well, and in the case of sedentary persons it is advisable that total abstaining from it at all times be the rule.

In fact, it is the opinion of the writer that none but a hard working laborer should eat meat more than once a day, as in such a case, on account of the usually excellent workings of his metabolistic functions, a diet of any kind should be digested without the slightest particle of trouble. But even here I think that meat not eaten at all and the albuminates replaced by oatmeal or wheatena he would be better off in the end.

It would seem that a suggestion to to the poor man that he dispense with the use of meat is apt to be usually resented as an affront, as to him and his family its use is as essential on the same principle as a carriage and horses

are to the parvenue, a necessary factor to keep up and maintain a quasi social standing in his "set."

In all others, especially the sedentary and brain workers, an excess of animal food is liable to generate a condition of uricacidæmia in a more or less aggravated form, and at the very least in the latter class of individuals, clouding the intellect so as to incapacitate for good work; together with, in the cases of all, the ever present liability to generate ptomaines in the body of a toxic nature which in its errand of mischief finishes up what the uric acid leaves undone.

Especially in children is the abstenance of animal food to be encouraged, as in them it causes a condition of apparent anæmia due to spasm of the vaso motor nerves, relief from which ensuing on the discontinuance of this diet for one of a more hygienic nature.

The use of eggs as an article of diet may be borne well and resultant of no

bad effects, but although not containing uric acid or any of the xanthin group, yet in some cases brings about a large increase of this product in the urine, and in such should be avoided.

Haig also includes as producers of uric acid, the various pulses, as peas, beans, etc.; when should we find in a patient, on a diet in which they are allowed, a continual large excretion of urea, it would be well to stop them for a time at least to ascertain if they are at fault.

Experience has demonstrated that one who has been on a uric acid forming diet, on giving it up suddenly, will, while the urates are passing out, feel wretched and despondent, as also weak and disinclined for any kind of work; therefore, in cases where we have large accumulations in the system, it is best to gradually wean the patient from the habit of a meat and xanthin diet, as the sudden change may bring

about a serious condition of high blood pressure and its results, owing to the outpouring of the excess of uric acid from the tissues in the blood; a condition more liable to occur in the middle aged and old people, the manifestations being from vertigo in a mild case to apoplexy in a severe one.

Fruit and vegetables should at all times enter largely into the diet, and according to Burnett, in writing upon this subject, he says, "The tissues of those who do not eat fruit and vegetables show signs of decay and senility at an age much earlier than in those partaking largely of these articles of diet."

Vegetables contain a large proportion of water, but are valuable on account of their mineral constituents, increasing the alkalinity of the blood, and consequently solvents of uric acid, especially potatoes and spinach, also Brussel's sprouts, cabbage, cauliflower

and peas. Of these, cauliflower contains 1.53 per cent. albuminates, spinach 3.15 per cent., and Brussel's sprouts 4.83 per cent., thus making them of considerable nutritive value also.

Regarding the cereals, wheat contains 14.15 per cent. proteids, while oats, somewhat less, yield 11.12 per cent. of the same.

Fruits as an article of diet, although possessing a low nutritive value, consisting largely of water, and of their solids only a small proportion of nitrogenous matter; their chief food value is in the sugar they contain, which is in considerable amount; its advantages consisting of its ready solubility, needing no previous digesting, although when used with other articles of diet is apt to give rise to acidity and flatulence in dyspeptics and in individuals with a weak digestive apparatus, due to an acid fermentation in the alimentary

canal; still, when partaken of alone as is advised in these cases, this possibility is avoided; but in all cases, however, their use should be begun sparingly and with care.

Another important class of ingredients are their salts composed of the alkalis in combination with the vegetable acids, malic, citric, and tartaric, together with some free acid as well, which, all being converted in the system into carbonates, these acids (unlike the inorganic) exert no restraining influence on the uric acid excretion, while the alkali lessening the acidity of the urine and increasing the alkalinity of the blood thus constitute conditions more favorable for the excretion of the uric acid; especially at this particular period (breakfast), when the excretion of this product is at its maximum (9--12 A. M.), a diet of this description aiding rather than hindering, as some do, the outflow, is peculiarly of advantage, as

the average diet tends rather to drive the uric acid into the tissues than aid in its elimination.

Under no circumstances, however, should sour acid fruits be partaken of by these individuals, as the system being weak and the acid in excess, due to this tax upon the system, their conversion into carbonates as in the normal condition may not be possible under these circumstances, together with a lessening of the alkalinity of the blood driving the uric acid into the tissues and a diminishing of its excretion, which at this time should be at its maximum; later on in the day it will again enter the blood at a time when it should be at its minimum, therefore causing various disturbances and symptoms indicative of its presence in large amounts.

In the normal state, although fruit acids may lessen the alkalinity of the blood, it is of but short duration when

the acids are broken up into carbonates, the alkalis then coming into action and reversing the effects.

When fruit has not been partaken of previously by the individual to any extent, it may set up an uric acid storm, with symptoms of headache, bilious attacks, etc., this condition being due to a stirring up process of the retained waste products in the system, the blood becoming more alkaline and the uric acid in the tissues therefore passing into it.

In cases of this kind it is best to begin cautiously and increase the amount of fruit eating gradually, when it will not only be tolerated, but a beneficial action will in a short time be experienced in the prevention of the formation of an excessive quantity of uric acid.

As to the kinds of fruit to be eaten, preferably are advised apples, grapes, oranges or peaches; eating as much as

the patient desires, but of course not carrying the amount to excess.

In many cases much benefit is derived from a breakfast of nothing but fruit, and no other article of diet eaten before twelve o'clock, noon, except plenty of water during the intervals between meals.

Preserved, cooked, or dried fruits will not answer the purpose at all, and no sugar should be used with them, as fruit sour enough to require sugar to make it palatable is deleterious to these cases.

Two or three months of this diet will be necessary, when the patient may return to a proper mixed diet, when, should the symptoms indicate a return of the process of deranged nutrition, the fruit breakfast may be again taken up and persisted in until a cure is effected or lasting relief is obtained.

In the case of individuals with whom this form of diet does not agree even

after repeated trials, to such we would advise, if it be possible for them to do so, to dispense entirely with their breakfast, taking only a glass of hot water or carbonated water. This latter might seem impracticable to those occupied in some vocation, but as the class of individuals, in the large majority of cases, afflicted with this complaint, are not, as a rule, of this class, but ones who have no occupation and can lay around and take things easy, therefore we need not feel any hesitancy in advising this mode of treatment for them on account of any possible inconvenience.

In regard to cheese with its exceedingly high proportion of proteids (30–33 per cent.), in a large number of cases disagrees with the digestion when eaten alone, and even sometimes in combination is tasted for sometime after meals. It is best, when to be taken in large quantities, to mix with

some other article of diet, as macaroni, etc., to prevent a possible disagreement, and also in the cooking the addition of a little potassium carbonate makes it more easily digested. Or, it may be taken in the form of the so-called "cottage cheese," which in many cases is well borne when the ordinary cheese is not, and is as fully if not more nutritious and certainly contains less possible adulteration.

As to coffee, many persons are so accustomed to their cup of it in the morning for breakfast, that without it their meal is to them "incomplete," as they express it. For such a coffee substitute would be allowable, as there are now several varieties of this made that as taste goes are so little inferior to the average home-made coffee that a large majority of individuals drinking it would fail to detect the difference in them, also being non-stimulating, and by the manufacturers claimed to be

very nutritious, are to be recommended as of especial use in these cases.

As it is believed that in some of these varieties genuine coffee is added to impart a flavor, we must avoid such ones if we wish for good results with our patients who use these preparations. They are also a very satisfactory means of flavoring milk for those to whom the taste of it is not palatable.

Milk being a very essential article of diet for these classes of cases, as it does not generate uric acid in the system, acts as a mild diuretic, and at the same time a most nutritious form of food, should be partaken of freely and in large quantities. Some individuals seem to be under the impression that it does not agree with them, makes them "bilious," as they express it; but invariably we may attribute this fault to something other than the milk. In cases of dyspepsia following its use, a teaspoonful of lime water to the glass

will usually correct this, when, if in case it still persists, by drinking it slightly warm about an hour before meals and with no other food, as a rule all trouble from this will be ended.

It would seem to one that this would destroy the appetite for the meal coming so soon after, but instead of doing so, strange to say, those who have tried this claim that it rather gives them an appetite for the following meal.

Another very important factor in the treatment of uricacidæmia is the drinking of plenty of pure water, free from lime or iron, not less than six pints a day at the very least, and more, if possible, without any inconvenience ensuing. Most of this should be taken between meals, before retiring at night, and on arising in the morning, when, if the use of it at meals causes dyspeptic symptoms, as is often the case, none should be taken at this time. Under no circumstances whatever should we

drink ice water, nor even cold enough to chill the stomach.

In the commencement of this diet it is frequent for the bread and starchy foods to disagree, causing flatulence and a sense of oppression in the stomach. This is due in part to the increased quantity taken to compensate for the lack of animal food, which, on account of its concentration, seldom causes this; and another reason, that in meat eating, bolting, usually practiced, by the way, is possible as the main factor of this digestion is in the stomach, but in the case of the above as an admixture of saliva is absolutely indispensable, and which not being allowed, owing to this rapid eating, as a result digestion is slow and fermentation ensues.

The use of cane sugar, when it causes fermentation, gives rise also to acid products, and when such a condition arises should be prohibited.

The action of salt tending to cause a deposition of sodium biurates in the joints and tissues, it therefore should be used sparingly and all salt foods be abstained from. In severe cases potassium chloride as a substitute for salt is advisable, on account of its less prejudicial effects and also its moderately diuretic action

All acids and acid foods should be prohibited from the patient's diet.

Over-eating must not be indulged in, as not only in these cases but is always predjudicial to the well being of the digestive organs.

We hear complaints from many as to a feeling of " good for nothingness " to coin a term to fit the case, so often experienced Mondays after a hearty eating on Sunday, or the day following a holiday on which we have feasted too lavishly ; as in these cases meat is invariably an important item in the bill of fare, from which we may attribute

the bad effects to an excess of uric acid formed, as the disturbing element aided also by the usual lessened amount of activity on these occasions.

Just here a point mentioned by Burnett in his work on "Gout" might not come amiss. He suggests that in this complaint in those of hereditary tendencies and high livers a spare diet is not so beneficial as in those who live plain but from occasional high living are subject to its attacks.

During one of the so-called uric acid storms the diet should be of the plainest, and often in many cases during the severity of the attack nothing at all should be eaten, save possibly some warm water drunk at intervals to supply liquid for the system to assist the kidneys in carrying off the excess waste products.

In regard to the use of alcohol in this class of cases, it should not be used at all as a beverage. If stimu-

lants are really needed at any time a little Scotch whiskey may be allowed as preferable on account of its little or no acidity, but port, sherry, burgundy and champagne, together with malt liquors and porter, should be prohibited on account of their acidity, and to which champagne is attributed the most pernicious, as the most acid.

These are more liable to give trouble in the case of meat eaters than in those not given to this form of diet; and to these contained acids is to be attributed the mischief making, as the action of alcohol pure is that of an alkali in diminishing the acidity of the urine and for a time increasing the excretion of the uric acid.

A few points as to the uric acid forming properties of some articles of diet might be of service to bear in mind.

Young meat, as lamb and veal, contains more uric acid, 3.5 grains to the pound, than old meat, as beef or mutton, containing 1. grain to the pound.

Kidneys contain 3.5 grains and liver 6.5 grains to the pound.

Fish has only 1. grain, but beef tea contains 7. grains to the pound.

Of the xanthin compounds, which, as we know, while not uric acid, still in their passage through the body become such; of these cocoa contains 59 grains, coffee 70 grains, and tea, the largest of all, 175 grains to the pound.

From this we can readily understand why the latter plays such havoc with the nervous system.

As to articles suggested for diet the following quantities are to be recommended:

Milk containing 3–4 per cent. albuminoids, 3–4 pints per day.

Cheese containing 33 per cent. albuminoids, 2 ounces per day.

Bread containing 8 per cent. albuminoids, 12 ounces per day.

Oatmeal containing 12 per cent. albuminoids to equal 2 ounces dry per day.

Wheatena containing 16 per cent. albuminoids to equal two ounces dry per day.

Besides plenty of fruit, vegetables and water.

In concluding this subject, as to a diet suitable for this condition, while to some it might appear but a step above starvation, I can assure the hesitating ones that their nutrition will in no wise suffer, and besides after giving it a fair trial will derive so much benefit from it, and feel so much better than when on a uric acid forming diet, that they will not care to return to their old habits, in fact some even acquiring a distaste for these articles of food, although favorites in the past.

Of course the difficulty will be to induce these patients to try this form of diet, as they cannot realize the possibility of dispensing with what they have considered so essential to their nutrition. But we should strenuously advise it and do all in our power to wean them of their bad habits, when if they will not take our advice the loss is theirs, we will have done our duty and on this point at least can go our way with a clean conscience.

TREATMENT.

DRUGS.

In a condition of this kind dealing with a substance in the system acting largely as a foreign body, we can readily understand that the first indication in our treatment is its removal, the excess waste products eliminated from the system; then by diet and other measures its further increase and retention prevented, when by means of our remedies as indicated endeavor to set right whatever bad results that remain.

In many cases, however, of long standing and where serious organic lesions have not occurred; with old habits corrected, reformed diet, with an eliminative treatment, proceedings that are absolutely essential in all cases, these will be all that are necessary to effect a

cure; but in an individual where this condition has been of long duration, a matter of years, there is usually a certain amount of deep-seated damage set up, possibly organic, which will sometimes require long and persistent treatment to rectify, and in some cases not to be cured. Such as these will tax our knowledge of the materia medica, as they are to be treated purely according to the organ or structures involved.

No doubt in some of these cases of simple excess formation and storage in the system, after a change in living and a diet stopping this increased product, but requiring a considerable time to do so, nature would gradually eliminate the superabundance of uric acid in the tissues and blood, but during which time, however, the patient would be living a life of utter wretchedness, depression, malaise, etc., therefore it is always advisable to adopt an eliminative form of treatment to get rid of this

as soon as possible, to start the patient on the right way to recovery.

To accomplish this we have many agents; in fact, the manufacturing pharmacist has here been particularly generous, as it would seem that he had made it a veritable target for his creative genius, so numerous have they been; the last better than all the others combined and the only perfect one; and, as a rule, the majority of them after being weighed in the balance are found decidedly wanting in respect to the qualities claimed for them. But aside from these there are several reliable and efficient agents capable of accomplishing these results in a most satisfactory manner, the properties of which we will now discuss.

Haig advises and his apparently favorite method of elimination of the urates from the system is by means of the salicylates.

By their action increasing the solu-

bility of the uric acid by forming with it salicyluric acid, at the same time increasing the urinary secretion and thus carrying it out of the body. This substance being soluble in slightly acid solutions and insoluble in alkaline, acts therefore best when the alkalinity of the blood is low.

Warmth also hinders its action due to this raising the alkaline reaction of the blood, therefore its administration in warm weather is not as resultant of good as some other agents.

It is always contraindicated when gastric disturbances are present, an existing debility or physical depression, and should not be administered when dyspnœa or cyanosis exist or any form of heart disease, as it may cause heart failure by the increased blood pressure from the outpouring of the stored up uric acid in the blood. In certain nervous individuals salicylates in large doses develop neurotic symptoms, even

going on to delirium; and, as it acts as an irritant to the kidneys, should be but sparingly and cautiously given when they are deranged. As large doses also cause dyspnœa, therefore should be administered with care.

When necessary, Haig advises a continuance of this treatment for a long time, months or even years (1–3), as he claims that this may in some severe cases be required to eliminate the urates from the system stored up from past excessive accumulations.

He further advises that the diet be not changed too soon, until the salicylates have had time to act in their eliminating sphere, preferring to accomplish the clearing out first before stopping the excess formation.

To insure the acidity necessary to free the blood of uric acid, and for the proper action of the salicylates, he recommends its alternate use with acids, as nitro muriatic acid, 2–3 gtts. in half

glass of water, taken before meals (a free dilution of it is necessary, as it may otherwise cause a fall in acidity instead of a rise in it), and salicylate of sodium, x-xv grains, after meals and at night (four times a day), in water or milk. Sometimes it is well to give at the same time aromatic spirits of ammonia, x–xv gtts., as ammonia although an alkali, still, as Haig informs us, in this connection raises the acidity of the urine and aids the excretion of uric acid; also assisting the action of the salicylates. No doubt a satisfactory result is obtained by the administration of this agent, but the reason of its action does not seem quite as much so.

Under such circumstances it would seem well to try salicylate of ammonium.

This acid (nitro muriatic) recommended simply removes the uric acid from the blood and drives it into the tissues, when the use of salicylates is

necessary to eliminate it from the system; otherwise, when the drug is left off, the urates return again into the blood, and the same old train of symptoms again occurs. During this stage, when the blood is free, an actual state of stimulation exists with a lowered blood pressure, quickened circulation and pulse, with also a brightening up of the intellect, allowing an increased combustion and metabolism throughout the body. In subjects susceptible to it also producing gout.

Another form of treatment recommended by Haig for the removal of the urates from the blood is by means of calomel in ¼ grain tablets, 2–3 doses at ½ hour intervals; or else mercuric iodide ⅛ grain, 2 doses as above, followed immediately by the same salicylate treatment. This, as a rule, is necessary to be repeated for several days (4–5) to clear the blood completely and effectually of these retained waste products.

When for any reason an agent is required to drive the urates at once out of the blood for relief of present existing symptoms, a nitrite, as glonoin 1-100 minim, or sodium nitrite 2 grains, or else morphia 1-6 grain will suffice.

In cases where mercury is contraindicated for any reason, nitro muriatic acid, as hitherto been suggested, is preferable.

It may seem to some that I have dwelt at too much length on these methods of Haig, as they may not be acceptable to all of us, but as he being acknowledged the foremost authority on this subject (uric acid), it has seemed to me that we should have a clear idea of his views on the treatment of this condition; even although we have no occasion for its present use, there might come a time when all other means failing we would be very glad to avail ourselves of these measures.

Another nitro muriatic acid method

recommended is the following: 3–5 grains of this agent after meals and at night in a ½ glass of water; always after taking rinsing the mouth with water and drinking another glassful. To be followed by sodium phosphate and alkali or else piperazine to remove the urates from the system. This treatment should be always begun a week or so before expected attacks if possible, as sick headache, etc.

In warm weather when salicylates are not indicated, sodium bicarb. 30 grains t. i. d. between meals raises the blood pressure and retains the urates in the blood so as to admit of their elimination, but diminishes the excretion of the urine. Potassium bicarb. 30 grains t. i. d. has the same action as the above, but is more of a diuretic.

In very many cases irrespective of season these agents are often preferable to salicylates and fully as effective; in fact, in debilitated individuals they are much safer at all times.

Lithium, regarded by the laity and a majority of the profession as the grand cure-all for this—the uric acid diathesis—has been laid in the dust by Haig, who claims that it exercises no influence whatever upon the excretion of the urates, but, as I have said before, combines with the phosphates of the blood, raising its acidity, and drives the uric acid into the tissues; a condition of relief of but short duration, as it does not eliminate it from the system as we have hitherto been led to suppose.

Previous to becoming aware of this fact, the writer had often wondered at the entire absence of results obtained by him from this drug, it never seeming to afford the slightest relief in his experience.

Lithium salicylate has yielded better results, probably due to the action of the salicylic acid in this combination. However, in the opinion of the writer,

that, as there are many eliminatives so far superior to lithium, we should avail ourselves of them, and only when nothing else is obtainable resort to this agent, and then only when a salicylate.

Phosphate of sodium for the elimination of urates from the system, in doses of 30–60 grains, 2–3 times a day, not allowing the bowels to become too free, is the most effective and thoroughly to be relied upon for this purpose of all the eliminatives. To obtain the full benefit from it an alkaline media is necessary for its action; therefore it is best given with sodium bicarb., as in an acid solution it becomes an acid phosphate, an insoluble compound in the blood, thereby being rendered useless for this its desired purpose.

Piperazine is a valuable agent for this condition, its directions for use being: 15 grains in a quart of water to be taken in one-half glass doses throughout the day.

Gicht wasser of Wiesbaden is also recommended as of benefit.

Of late a certain number of organic compounds have been introduced with great claims as to their efficacy in forming soluble bodies with uric acid in the system, and thereby facilitating its easy elimination, such as: lysidine, piperazine (already mentioned), formine, lycetol, sidonal, etc.

The value of these, with the exception of piperazine, is as yet problematical, although most enthusiastic reports are heard from some quarters regarding their value in these complaints, as a rule, however a large majority of the results having been obtained from experiments outside the body. But owing to the fact that our results in the laboratory are not by any means borne out in the human body accounts for the fact that physiological chemistry is not yet an absolute science, and also that we cannot place an implicit reliance upon

these compounds, or others of a similar character, for this purpose as yet, until clinical experience has demonstrated that they are what they are claimed to be. Time and trial will demonstrate the value of these, when the good will rise to the top and the worthless will sink to the bottom. That is, it should be this way, as it sometimes is not.

The following treatment has also been recommended for this condition:

℞. Theobromine, ʒ iv.
Lithium Carbonate, ʒ iiss.
Sodium Benzoate, ʒ j gr. xv.

M. S.—Divide into sixty tablets. One to be taken each morning.

Administer for twenty days during each month, for about six months.

An interval of two months may then be allowed to elapse, and the treatment be resumed for another six months.

For the feeling of coldness or cold extremities, a common symptom occurring in these patients, nitro muriatic acid dilute, 10 minims in ½ glass of

water before meals, followed by the salicylate or soda treatment after meals. Recommended by Haig.

For gout he also advises salicylate of methyl x–xv gtts. painted externally on the affected part, protected with an impervious covering

Having laid before the reader a very wide selection of "old school" remedies and forms of treatment, I will now take up what methods are adopted by the homœopathic school; its point of advantage being its ability to cope with the after conditions which frequently occur as a sequelæ in these patients, besides by no means devoid of methods of its own to effect the elimination of the offending products when in excess.

Ever bearing in mind the old saying about "two strings to one's bow," and the advantages of this dual capacity, notwithstanding which there comes a time when the destroying processes of nature are not to be vanquished by

either, verily it would seem that he who would scorn the methods of any school of medicine is but half armed for the fray.

Urtica urens. This remedy was introduced to the medical profession for the purpose of eliminating the excess urates from the system by the late J. Compton Burnett, who modestly in his little book on "Gout" informs us that it will not in all cases fulfill this function. Such a marked contrast to the extravagent claims made for some of the exploited cure-alls, regarding which it would be perfectly proper to rather state as an antithesis that in all cases they will not fail, although our experience might have led us to so infer. Nevertheless it is an agent of great worth in this class of cases, and usually giving satisfaction when used according to his directions, viz., in acute attacks 5 drops of the tincture every 2–3 hours in a wineglassfull of warm water,

while in the more chronic conditions, he advises 10 drops morning and night or t. i. d. in the same menstruum.

He does not give marked indications for its use, but rather suggests it on general principles; still it is a remedy we should ever have in our mind when treating uric acid patients, and often then to administer it with the one indicated. Its results are as a rule quick and lasting, being not only an eliminant, but also when in conjunction with hygienic measures and diet a curative agent that is also prophylactic to the after effects of uricacidæmia.

To those of our school to whom the dosage given above would seem as heretical, a "backsliding" process, so to speak, the writer would say that in mild cases with symptoms of uric acid retention he has obtained very satisfactory results from doses of ½ to 1 drop.

Aurum muriaticum 3x v. gtts. in water every three hours is a most excel-

lent remedy given on general principles for the various sequelæ of uricacid-æmia, for the conditions remaining over after the stored up products have been excreted and a new diet instituted; its characteristic symptoms being great mental depression, and in old and worn out subjects.

The various conditions in which it will be found useful are the following: Cardiac hypertrophy, powerful action, with rush of blood to head and chest; palpitation of the heart; high blood pressure. Arterio sclerosis.

Different varieties of neuritis, as also neurasthenia.

Interstitial nephritis; early and late stages.

Hepatic cirrhosis; sclerotic stage.

Spiritus glandium quercus x. gtts. of the tincture in water t. l. d., also recommended by Burnett, is another valuable remedy in the case of old alcoholics and high livers. He claims that it will di-

minish if not remove the craving for spirits. Disease of the spleen is one of its chief characteristics, with pain in that region.

The following is a classification of the various conditions developing from uric acid as a causative factor, together with their appropriate remedies as indicated for them:

1. Nervous system: Arsenic alb., aurum muriat., kali iod., spigelia.

2. Heart and Circulation: Arsenic alb., aurum muriat., cactus, berberis, chelidonium, china, iris versic., mercur. dulc., nux vom., podophyllum.

4. Respiratory Tract: Arsenic alb., arsenic iodide, grindelia, kali iodide, sulphur.

5. Urinary Tract and Kidneys: Arsenic alb., aurum muriat., berberis, cantharis, coccus cacti, ferrum phos., kali chlor., lycopodium.

6. Gout: Colchicin 3.

Arsenicum album 3x. Asthmatic at-

tacks; especially during the intervals, with co-existing heart disease, restlessness and wheezing.

Prostration after all attacks; cardiac palpitation, precordial pain, dyspnœa, weak heart, rapid irregular pulse. Arterio sclerosis.

Angina pectoris, in the intervals only.

Interstitial nephritis, both acute and chronic forms.

Neuralgia, worse from cold, intermittent, periodic.

Neuritis, burning pains. Neurasthenia.

Gastritis, vomits everything taken into stomach, excessive prostration.

Arsenic iodide 3x. Hay fever, rhinitis, sneezing, acrid discharge from nose, mucous or watery prostration.

Berberis tinct. Gall stone colic, pains, burning and boring.

Lancinating or throbbing pain in the kidneys, worse sitting or lying and on rising from stooping; better standing. Urine turbid, bloody or scanty.

Cactus 1x. Cardiac hypertrophy, palpitation, and congestion; feeling of constriction.

Cantharis 1x. Burning pain in the kidneys; constant urging to urinate, only a few drops passing, with burning pains; scanty burning urine.

Chelidonium tinct. Chronic congestion of the liver, pain under inner angle of right shoulder; sallow skin; yellow coated tongue; dull headache; constipation; fullness in region of liver; sharp stitching pains; radiating to right shoulder; gall stone colic; bilious headache; migraine, with nausea and vomiting of bile.

China 6x. Claimed to prevent the tendency to formation of gall stones.

Hepatitis. Periodicity.

Coccus cacti tinct. Renal colic. Uric acid stone.

Colchicine 3x. Acute attacks of gout.

Ferrum redactum 2x. Anæmia, chlorosis; pale skin; sudden flush-

ings; chilliness; headache; hemoglobinuria; amenorrhœa or excessive menses.

Ferrum phos. 3x. Interstitial nephritis; hemoglobinuria; urine brown or blackish red.

Grindelia tinct. Asthmatic attacks.

Iris versicolor tinct. Sick headache, beginning with blur before the eyes, followed by nausea and vomiting of mucus and bile. Pain over liver; griping pains.

Kali chlor., 3x. Hemoglobinuria; urine brown or blackish red.

Kali iodide, one grain doses. Asthma, wheezing, tightness of chest.

Promotes the absorption of effusions. Nasal discharge watery.

Lycopodium 3c. Pain in back. Uric acid sediment. Uricacidæmia in men.

This drug for this condition is as largely overrated in our school as is lithia by the "old school." However, some good results have been obtained

from the use of the tincture in these conditions.

Mercurius dulcis 2x. Liver enlarged and sensitive; tongue coated thick yellow; bad breath; jaundice; clay colored stools; tongue retaining imprints of teeth; gums sore; salivation.

Naja 3x. Palpitation in cardiac hypertrophy; oppression.

Natrum muriat. 12c. Neuralgia; neurasthenia.

Nux vomica tinct. Cirrhosis of the liver; gastric symptoms in high livers; fullness and pressure in stomach; vertigo; pain in back of head.

Podophyllum 1x. Congestion of liver; fullness and pain on right side; jaundice; bilious headache, with blur before the eyes; vertigo; vomiting of bile.

Phosphorus 3x. Hepatic cirrhosis and fatty liver.

Interstitial nephritis; nervous debility; albuminous and bloody urine; neurasthenia.

Sepia 3*x*. Chronic liver disorders especially in females; dark haired; sallow complexion. Uricacidæmia in women.

Spigelia tinct. Heart; violent pain; irregular action; palpitation; irregular pulse; syncope. Neuralgic affections.

Sulphur 6x. Asthma of gouty or uric acid subjects; chronic conditions.

To promote the reabsorption of inflammatory products.

Thlaspi bursa pastoris tinct., v–xxx gtts. Hematuria.

A typical case in the writer's experience will better demonstrate these principles.

X——, 45 years of age, possessing an inherited gouty diathesis; (paternal) from a child had always been an extensive meat eater and drinker of tea, caring little for vegetables and not drinking much water.

Occasionally throughout childhood had been subject to sick headaches, but after the age of 21 they became more severe and frequent, occurring from the slightest provocation, as a trivial error in diet, a little too much exercise, attending a crowded assemblage, especially when the air was not pure (more likely in the morning), and as for a railroad trip, that seemed to have an especial action in laying him up completely, so that traveling became a veritable object of dread.

These headaches usually coming on at midday, reaching their severity by night, with nausea and vomiting of bitter liquid and food last eaten.

When on sleeping through the night would awaken in the morning usually free from the headache, and remaining well for the time until the next attack, this coming on, acting and lasting about the same as the last.

As to periodicity, would occur about once a week, sometimes more often, occasionally less frequently, the intervals between these attacks being shorter in the cold weather than in summer, when they were very rare.

At all times the patient was very susceptible to the cold, it sometimes amounting to almost actual suffering; besides possessing a tendency to take cold on the slightest exposure to the air.

These headaches coming on frequently from ordinary fatigue, and especially so from exercising in the cold out of doors.

But by following out the ideas promulgated in this book, the patient has for the last three years been almost entirely free from these headaches, only on certain rare occasions appearing to remind him of the past.

Railroading still is not possible without sometimes causing trouble, but this is not as bad as it was once. In summer, when the doors and windows of the cars can be kept open, experiencing little inconvenience, but when in cold weather with the usual bad ventilation, the old complaint is very likely to show itself, but even then in a milder degree of severity.

Also the suffering from the cold has become considerably diminished, so that even the exceedingly raw climate of Brooklyn has become tolerable without causing the usual amount of suffering as hitherto.

The patient previous to this treatment on consulting physicians invari-

ably received the same advice from all, "take exercise," the result of which, if not sparingly indulged in, to again bring on the old trouble, but this suggestion, if made by him to anyone, to be received with incredulity as something ridiculous or impossible.

Applying the principles enumerated in this book to this condition, it is easy to understand the reason of the above occurrences; knowing that an unusual exertion calls into play an excess metabolism and its consequent process of combustion in the system, an enlarged amount of waste products, and a body already charged with them unable to throw off the amount now present, any increase is sure to be felt and consequently cause trouble.

Such was the case here in one suffering from uricacidæmia.

Remembering at all times in this condition, the indications are: Get rid of the increased waste products in the

system, prevent an excessive reformation, when exercise will be rather a source of pleasure than a cause of discomfort, even suffering.

CONCLUSION.

Thus ends my work for the present time, although this by no means exhausts the subject or is entitled to be considered as complete, which, owing to its complexity, will be long before it is perfectly understood, if ever.

However, the dawning light has already burst forth and we now have some dim perceptions regarding uric acid from which it is possible to gather a somewhat intelligent idea.

The uric acid diathesis is still by some considered a myth, as non-existing; but to all of this opinion we feel very much like saying with "Romeo," in the work of the immortal Shakespeare, "He jests at scars who never felt a wound." In short, because the scoffers and doubters have never met

with a case of this kind, therefore it cannot exist.

We, of the medical profession, sometimes change our views, therefore this course is still always open to the doubters.

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